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FISHERY MANAGEMENT PLAN

FOR

LAKE ANDES

NATIONAL WILDLIFE REFUGE

LAKE ANDES SOUTH DAKOTA

U.S.
FISH & WILDLIFE
SERVICE

PREPARED BY THE U.S. FISH AND WILDLIFE SERVICE
GREAT PLAINS FISH AND WILDLIFE ASSISTANCE OFFICE,
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LAKE ANDES NATIONAL WILDLIFE REFUGE
LAKE ANDES, SOUTH DAKOTA

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INTRODUCTION

Lake Andes National Wildlife Refuge is located in southeastern South Dakota, near the town of Lake Andes, and is managed primarily for waterfowl production. The refuge has an easement that encompasses the entire lake, but the only fee title land is at the north end of the lake and the Owens Bay Unit (Fig. 1). Historically Lake Andes was a much larger body of water. In 1922 Congress authorized the construction of an outlet structure which established a high water elevation of 1437.25 feet above sea level, effectively lowering the lake water level by 13 feet.

The lakes watershed is about 84,000 acres which is mainly agricultural cropland interspersed with prairie grasslands. At full pool, Lake Andes is approximately 4,180 surface acres, with an average depth of 3-4 feet. Most of the lakes water enters through Andes Creek on the north end of the lake with additional water entering the south unit via Owens Bay. Rainfall averages 55 cm per year, while evaporation averages 96 cm per year. Depending on annual precipitation, Lake Andes fluctuates from practically dry to completely full. The lake is divided into three units (Fig. 1) by dikes which serve as county roads, but the water flows through the units unchecked.

The North Unit is about 680 surface acres with a maximum depth of 10 feet, the Center Unit is about 1,900 surface acres with a maximum depth of 11 feet, and the South Unit consisting of approximately 1,600 surface acres with a maximum depth of 11 feet.

Lake Andes has a long history of providing recreational fishing. From the first stockings in the early 1900's and the subsequent heyday of "renowned" largemouth bass fishing to the present day problems related to increased local irrigation demands, sedimentation, and intermittent fish kills. The last documented renovation was 1958, with restocking in 1959. After ample rainfall in 1962 the lake filled and provided quality fishing for several years. In the winter of 1964 a partial winterkill was observed and fishing declined, since then numerous stockings have taken place, but the stockings have not produced a satisfactory fishery. The Lake Andes fishery can be considered a boom or bust fishery, with exceptional fishing for a short period of time during high water levels, followed by marginal fishing or worse until the lake dries and a complete fish kill occurs. Unfortunately most fishermen only remember the boom years and would like a fishery maintained as such. Without a constant source of flowing water, the lake level fluctuates depending upon the amount of annual precipitation that occurs. The fluctuating water levels are detrimental to most game fish species (e.g., largemouth bass, yellow perch, and northern pike), but less harmful to less desirable fish species (i.e. Bullhead and Carp). Rough fish usually dominant the lake after winter kills.

Because the lake can go completely dry in the summer and/or winterkill management of the fisheries is extremely difficult.

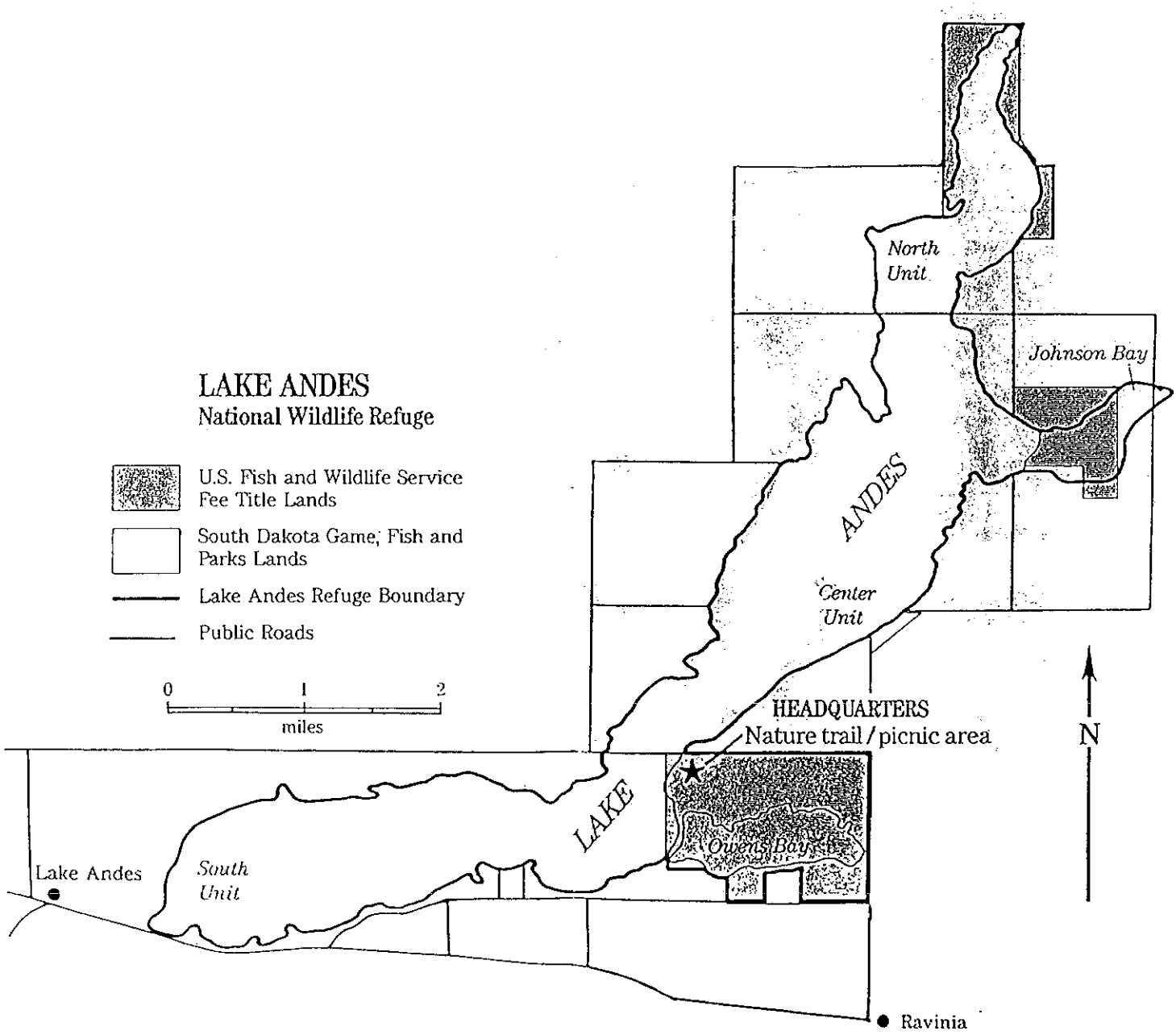

Figure 1. Map of Lake Andes National Wildlife Refuge

(South Unit)

The southern unit is located on the eastern edge of the town of Lake Andes. The south unit is separated from the middle unit by a county road that leads to the refuge office. The inlet to the south unit has no control structure, this allows movement of fish between the south and center units. Several residential dwellings are located along the shoreline. Along the southern edge of the south unit is the main control structure that lowered the lake level 13 feet to its present level. The main control structure has a fixed level so water levels can not be manipulated.

The south unit is approximately 1,000 surface acres with an average depth of 3-4 feet and a maximum depth of 11 feet (Fig. 2). A Sedimentation Survey Report (completed February 1993) by the Division of Water Resources Management, Department of Environmental and Natural Resources, South Dakota, showed the lake to have a mean depth of 3.10 feet and a mean sediment depth of 4.68 feet. The bottom is made up primarily of organic muck which is slightly flocculent. Large rocks and boulders are present along the shoreline. The water is highly turbid due to the large number of rough fish (i.e., carp and bullhead). Submergent vegetation is absent due to high turbidity. Emergent vegetation is primarily cattail and limited to the shoreline.

Conductivity averages 3300 at 16^0C. Total alkalinity is 136 ppm and phenolphthalein alkalinity is 0. The pH averaged 8; secchi disc readings average 0.5 feet.

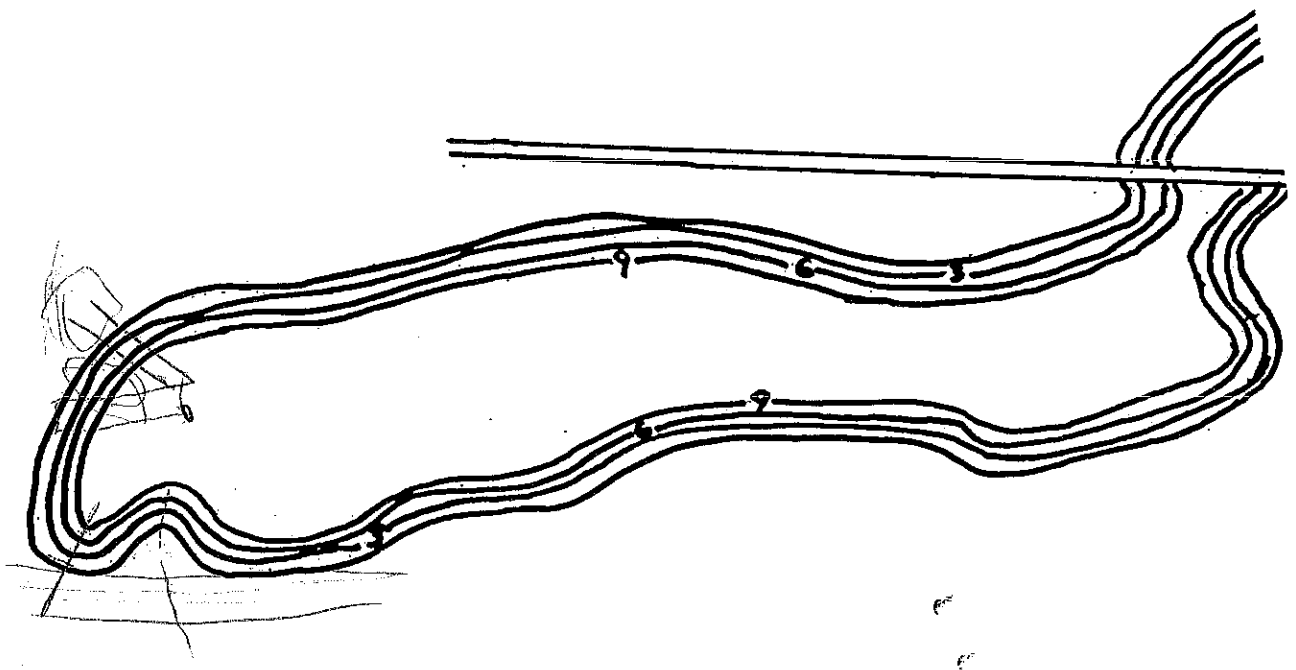

Figure 2. Contour map of Lake Andes (South Unit) at full pool.

The large numbers of carp and bullhead contribute to high turbidity which lowers light penetration and limits the amount of submergent vegetation. With no submergents; reproductive and nursery habitat of game fish (northern pike, yellow perch) is limited. If water quality could be improved a northern pike, yellow perch fishery could be maintained during high water periods. The northern pike and yellow perch are better able to withstand lower dissolved oxygen levels, therefore providing a fishery during low water levels.

Without a constant water supply and the eradication of the rough fish, the fishery in Lake Andes will continue to be marginal at best. Several alternatives to improve water quality would include; 1) Introduce adult northern pike into lake as a means of controlling carp recruitment; 2) Renovating the entire lake and watershed, installing rotary screens at the control structures including the inlet of Andes Creek; 3) Dredging the South Unit (Appendix C); 4) Obtain congressional approval to raise the lake up to the original level of 1450 feet above sea level.

LAKE ANDES MANAGEMENT PLAN

Fisheries management activities will be a coordinated effort between the U.S. Fish and Wildlife Service, South Dakota Game, Fish, and Parks with input from the local citizens. An annual meeting will be held in the vicinity of Lake Andes to discuss current lake and fisheries conditions, exchange information, and develop strategies.

Current management activities will be directed towards the south unit of Lake Andes which has the greatest potential for maintaining a fisheries.

Both agencies will pursue grants and other funding resources to improve the fisheries. Priorities will be given to developing fish barriers between the middle and south units, rough fish control, water quality improvement in the water shed, and developing a reliable water supply.

Northern pike and yellow perch will be stocked during 1994 and 1995. Northern pike will be stocked from either state or federal hatcheries (or both). Yellow perch brood stock will be transplanted from South Dakota Lakes. South Dakota Game, Fish, and Parks will be responsible for identifying a brood source but both agencies will assist in the transplanting effort.

The south unit will be resurveyed during the fall of 1995 to assess stocking success and develop future alternatives.

Commercial harvest will be used to control rough fish when their abundance and size warrants and it's deemed profitable for commercial interests. South Dakota Game, Fish & Parks will handle the permiting after consulting with Refuge staff.